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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/803,066

03/16/2004

Koshi Hatakeyama

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11/02/2005

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EXAMINER

SEVER, ANDREW T

ART UNIT

PAPER NUMBER

2851

DATE MAILED: 11/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/803,066

Applicant(s)

HATAKEYAMA ET AL.

Examiner

Andrew T. Sever

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 August 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) 26 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18, 21-25 and 27-32 is/are rejected.
- 7) ☒ Claim(s) 19 and 20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>10/2004, 7/2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of species I (claims 1-25 and 27-32) in the reply filed on 8/4/2005 is acknowledged. The traversal is on the ground(s) that there is no serious burden on the examiner. This is not found persuasive because applicant specifies at least 5 separate embodiments, which required separate description in applicant's specification and accordingly would require 5 separate searches and/or considerations, which would create a serious burden on the examiner.

The requirement is still deemed proper and is therefore made FINAL.

2. Claim 26 is withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 8/4/2005.

Specification

3. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-5, 22-25, 27, and 30-32 are rejected under 35 U.S.C. 102(b) as being anticipated by Tejima et al. (US 5,442,413.)

Tejima teaches in figure 12 a projection optical system projecting light from an original image onto a projection surface, comprising;

A plurality of optical elements (10, 51M, and 20); and

A first optical system (10) constituted by at least one of the plurality of optical elements and having an ability to form an image with the light onto a predetermined surface different from the projection surface;

Wherein a first optical element (51M) of the plurality of optical elements is rotated substantially around a center of an exit pupil of the first optical system, such that a projection image of the original image is moved.

With regards to applicant's claim 2:

See column 12 lines 53-61 (it should be noted that the Fresnel mirror is incorrectly indicated in this paragraph to be part 31M instead of part 51M as shown in the drawings.)

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With regards to applicant's claim 3:

The movement must be parallel or tilting.

With regards to applicant's claim 4:

The original image can inherently be projected onto a spherical surface that meets the claimed language (even if it is not very high quality and distorted.)

With regards to applicant's claim 5:

Since the pupil is specified to be at 51M and 51M is optically closer to the projection surface, claim 5 is met.

With regards to applicant's claim 22 and 23:

Clearly as shown in figure 12 the light from the original image is obliquely projected onto the projection surface and a center of the original image is tilted with respect to the projection surface as is claimed in applicant's claim 23.

With regards to applicant's claims 24 and 25:

Part 10 is shown to be coaxial and rotationally symmetric (it is not specified to be asymmetric). It is made of lenses as is claimed in applicant's claim 25.

With regards to applicant's claim 27:

The projection surface is specified to be a screen, which are substantially planar surfaces.

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With regard to applicant's claims 30 and 31:

The system of Tejima is for an image projector using a liquid crystal display element (As is claimed in applicant's claim 31 and taught by Tejima in column 12 lines 38-52.)

With regards to applicant's claim 32:

The image-forming device inherently receives the information for the image from some sort of image information supply apparatus. This is how LCD's work.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 6-17, 21 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tejima as applied to claims 1-5, 22-25, 27, and 30-32 above, and further in view of Sasaki (US 2003/0035232).

As described in more detail above Tejima teaches a projection optical system which among other things comprises of a first and second optical system. However Tejima does not teach that the second optical system comprises a curved reflective surface.

Sasaki teaches such an optical system in figure 1. Sasaki teaches in paragraph 8 that prior art refractor based systems (Tejima is a refractor based system) include chromatic

aberration as well as other problems. Sasaki's optical system with curved surfaces allows for a compact image-forming optical system that is capable of projecting at a high angle of elevation while have good image quality (see paragraph 20). Accordingly it would have been obvious to one of ordinary skill in the art at the time the invention was and to use the optically system of Sasaki as the second optically system which comprises a curved reflective surfaces.

With regards to applicant's claim 7 and 13:

See paragraph 71 of Sasaki

With regards to applicant's claim 8:

Several additional intermediate images would be made. (Between each mirror for example 2 are indicated with the dashed lines.)

With regards to applicant's claim 9:

Since the intermediate image is an abstract point in the projection path, one position for the intermediate image could conceivable be placed at a location closer to the original image the reflective surface that is closest to the projection surface.

With regards to applicant's claims 10 and 11:

The reflective system of Sasaki comprises of at least 4 curved reflective surfaces. See above with regards to the intermediate image.

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With regards to applicant's claim 12:

Mirror 8 is at the position closest to the screen in the optical path and is shown to be concave. Mirror 5 is disposed closest to the screen and it too is shown to be concave.

With regards to applicant's claims 14-17 and 21:

See the above 35 USC §102(b) rejection, where the rotating mirror of Tejima comprises the third optical system.

With regards to applicant's claim 28:

The rotating mirror of Tejima comprises an optical deflection element.

9. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tejima in view of Sasaki as applied to claims 6-17, 21 and 28 above, and further in view of Wynne Willson (US 6,765,544.)

As described in more detail above Tejima in view of Sasaki teaches a projection optical system which among other thing includes a third optical system comprising a rotatable optical element. Tejima in view of Sasaki does not teach that the rotatable element comprises of two elements. Willson teaches such a device in figure 2, at least two rotatable devices 110 and 120. Wilson teaches in column 2 lines 43 through 67 in order to correct for keystoneing across two directions it is necessarily to provide two deflecting devices. Since it is desirable for a projection system to have as little keystoneing as possible, it would have been obvious to one of ordinary skill in the art at the time the

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invention was made to include the plurality of deflection devices taught by Willson in the projection system of Tejima in view of Sasaki.

10. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tejima as applied to claims 1-5, 22-25, 27, and 30-32 above, and further in view of Sunaga (US 2002/0008853.)

As described in more detail above Tejima teaches a projection optical system, which among other thing includes a projection optical system, that projects light from an image source. Tejima does not teach that the image source is a plurality of image sources. Such a system is taught in figure 7 of Sunaga where a 3-color path projection system is coupled with a reflective projection optical system. Such a system is a well known optical engine design, which provides for bright high quality images versus that of a single modulator system. Accordingly it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a 3-color path projection system with the reflective optical system(s) of Tejima.

Allowable Subject Matter

11. Claims 19 and 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

12. The following is a statement of reasons for the indication of allowable subject matter: The prior art does not teach the third optical system of a projection optical system having either a polarization splitting surface or $\frac{1}{4}$ -wave plate.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

US 2003/0107716 to Ogawa teaches in figure 1 a projector and projection optical system which comprises of off-axis curved reflective surfaces.

US 6,412,972 to Pujol et al. teaches in figure 4 a projector which has several rotating surfaces.

US 6,208,318 to Anderson et al. teaches in figure 3 a projector including a plurality of rotating optical elements.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew T. Sever whose telephone number is 571-272-2128. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Nguyen can be reached on 571-272-2258. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read "W B Perkey".

AS

William Perkey
Primary Examiner